UCD Supply Chain Consulting Project

Final Report

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TABLE OF CONTENTS

Table of Contents 1
Executive Summary 2
1 Introduction 4
1.1 Objectives of the Global Institute of Logistics 4
1.2 Project Description 5
1.2.1 The best practice of port authority management 5
1.2.2 Project Overview 6
1.3 Market Analysis 8
2 Company Analysis 12
2.1 Company Overview 12
2.2 Issue Analysis 14
2.2.1 Process Map 14
2.2.2 Information Gap 16
2.2.3 GIL Website 17
Recommendations 43
Conclusions 45
Appendices 47
References 48

EXECUTIVE SUMMARY

The following report is dedicated to a yet mainly unrecognised challenge. Sea ports provide cities and even countries with a great amount of economic growth and are part of about 90% of world trade. Logistics costs in general have been reduced during the last decades as companies optimise their own logistics within the firm and drive efficiency in order to reduce costs. This trend provided companies already with great cost reductions. Ports, however, do not operate at the efficiency level they could and therefore create a great potential for a further reduction of logistics related costs. As world trade increases, this means a greater need for efficiency within port operation.

In collaboration with the Global Institute of Logistics (in the following also referred to as GIL) certain problems have been identified. Ports are not just one business but consist of many independent service providers or companies. The greatest challenge for a port community seems to be the unequal distribution of financial power and authority among those service providers, which results in businesses within a port working as silos not considering other businesses and not sharing any information. This leads to the powerful companies executing their power and using it only for their own profit instead of using it for the benefits of the hole port which in the end is, what a customer evaluates the port by. Therefore, this unbalanced situation leads to unsatisfied customers and to the emergence of few ports that have recognized the challenge. In order to address this problem, the Institute collected practical information from ports and related businesses around the world. As a result a best practice was identified which is the Port of Valencia.

Firstly, a process map was established stating all major milestones of the Institute as well as mapping the next steps in order to put all information in a logical order to create presentable outcomes for a conference in Shenzhen which will change the Institutes character of being a not for profit organization to being a membership organization.

In this report collected information by GIL is validated by doing a literature review using the ten best in class operations of the Port of Valencia, which are namely: Cluster Leadership, Port Governance Strategy and Business Model, Infrastructure Planning, Marketing Hinterland, (Valencia) Port Community System (IT),

Environmental Management, Safety and Security, Quality Management, Training, and Corporate Social Responsibility. The literature review states the importance of the addressed topics and shows that other industries deem those issues important as well and have partly already addressed them.

The literature review together with the experience and collected practical information by the Institute certain steps a port has to go through to change which are Motivation, Mobilization and Adaptation using KAI. Kai is a theory that states that in order to create unity amongst a group of service provider of unequal authority and financial power, knowledge is the tool first deployed before authority and investment are needed to change physically.

The conclusions state that in order to cope with current economic trends and developments, port related businesses need to change. That means working closer together to firstly achieve sustainable competitive advantage and secondly, to increase customer satisfaction. Ports have a large impact on economies around the world and therefore, need to not use their superior power to solely maximise their own profits but to improve the performance of all port members in order to achieve higher customer satisfaction. The way to do so is building on relationships and establishing trust between port businesses, since further improvement can just be achieved by collaborating as logistics within one firm are mainly efficient.

1 INTRODUCTION

1.1 Objectives of the Global Institute of Logistics

The main goal and objective for the Global Institute of Logistics is to become a leading corporate university in the field of global maritime logistics study and giving an impulse for change. Therefore, GIL gathered information from ports around the world as well as from many academic and corporate thought leaders for over four years and needs to organize its data to be able to finish its research. GIL will use its research to implement a change in the way of thinking in the port industry. The tools used to achieve that will include **motivation** through published media such as annual reports and a website, **mobilization** through a committee and annual meetings and finally through **adaptation** by providing education and consultation on their ideas as well as their developed standardized performance measures of members in the port community such as the container terminal Quality Indicator (CTQI).

The project starts by building a process map to transform all the collected data from ports, academics and corporate thought leaders around the world into outputs. It provides an overview about what GIL has done and helps making familiar with the Institute's work and history of the past four years. This process map is of great significance to GIL since the company is lacking an appropriate process and an organized structure for its research transformation. The process map shows all significant inputs such as the 4 years of preliminary research as well as used media and conferences used as a source for rather practical research. This process map also includes a necessary academic validation of GIL's practical findings and closes with possible transformation tools. An comprehensive process map can be found in exhibit 1. The process map is important as it is momentarily used for a project in China and therefore a tool that can be applied to every other future project by the company.

Further, the project includes a website to be build using the process map as basis. It is therefore not just a transformation tool but also a first output and since it will represent GIL to its network and process some of the company's gathered information it is already the beginning of the actual transformation. For the project, this includes creating the academics and the port page. The academics page will validate GIL's practical research by preparing a literature review on the Best Practice in GIL's

research – the Valencia Case Study – demonstrating the importance of the modules included in the case study not just for the port industry but for all industries in general. The academic page will further include an introduction of scholars that are and have been important for the Institute and its research. The ports page will include all important data of the additionally identified ports representing a best practice in a special area as well as the corresponding case study collected by using questionnaires that are published on the ports page and accessible for ports online. This will not be finished during the project but GIL will continue working on it until and adjusting it beyond the Shenzhen conference.

In the following a detailed project description is given before providing a broad company analysis. Afterwards, a first issue analysis as well as preliminary findings are presented.

1.2 Project Description

The project has evolved over time and finally resulted in the following. It included designing a process map for GIL's process of collecting information as well as processing and validating it afterwards. Further, the project include the validation of collected information from seaports around the world in form of a literature review and proposed steps on how to implement the findings in a practical environment. The following describes the different parts in more detail.

1.2.1 The best practice of port authority management

Like many other government bodies, the port authority had played a rather "back-staged" role in terms of port operating management. Most of the port authorities had adopted the role of a landlord, where the port authority maintains the ownership within the port while the infrastructure is leased to private operating companies. The responsibilities of the port authority are mainly focused on areas such as economic exploitation, long-term development of the land, and also the maintenance of basic port infrastructure such as access roads etc. (Brooks, 2004).

The world of business, however, has changed dramatically in the past decade. Economist believe that globalisation is the main driver behind all the happening. Globalisation has a huge impact on many areas in many sectors, one significant change is that the traditional landlord business model cannot longer be followed if a

port wants to operate efficiently. Not only because the traditional model cannot handle the complex market changes but also more importantly it is not able to effectively help the organisation to increase revenue and gain competitive advantage in the port industry.

In 2007, GIL started their research in the port industry. At the beginning of the research the company focused on areas such as port management, port performance measurement and port development. The information they have gathered during this period of time had allowed them to gain an in-depth understanding about the issues related to ports and the causes behind their lack of competitiveness. One of the key issues discovered was that port authorities had not been sufficiently involved in port management and development. Therefore the Global Institute of Logistics research evolved around the question why such an important part of the port community had not played its leading role. The company focused on looking at the responsibilities of a port authority, the relationship between port authorities and their stakeholders such as terminal operators, shipping lines or end customers and the relationship between the named stakeholders within the port community. The end customers, companies such as Wal-Mart, Volkswagen or Apple, perceives the port performance in a combined manner and the port performance, as a result, is just as good as the weakest link within the port. Therefore the Institute believes that they need to analyse all the information and stakeholders that can be found within a port and that without considering all members the port performance cannot be evaluated correctly. According to GIL, the performance of a port and therefore of this logistics node and also of the whole supply chain is not just dependent on one single player in the port but on the whole chain of services and therefore all members involved. Therefore, the company came to the conclusion, that port performance cannot be seen independently but that it is a chain of different services and that the whole performance is just as good as the weakest link in the port community. The final finding of GIL was that ports are better off working in a cluster collaborating and coordinating together instead of behaving as silos and just caring about their own performance.

1.2.2 Project Overview

During their research the Global Institute of Logistics has found its best in class which is the Port of Valencia. The Port of Valencia is used as a benchmark as it is the

most developed port in terms of clustering and visibility to its end customers. The academic **literature review** based on the best in class – the Valencia Port Case Study – will provide a clear understanding of the theory behind the development and at the same time provide evidence on why clustering is the future for port management. The literature review will state the importance of each module of the Valencia case study by focusing not solely on the port industry but by as well considering best practices in other industries. Therefore the literature review provides a broad understanding of the relevance and increasing importance of the topics and is supposed to validate GIL's findings.

The Valencia Case Study consists of ten different topics, namely:

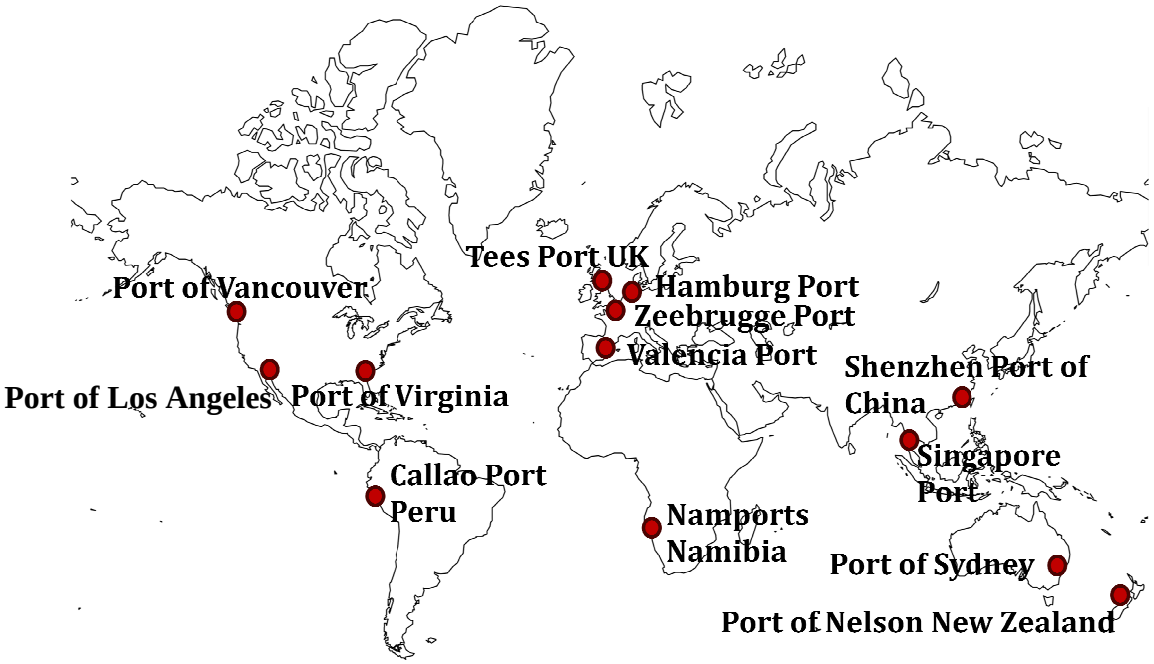
1. Cluster Leadership
2. Port Governance Strategy and Business Model
3. Infrastructure Planning
4. Marketing Hinterland
5. Valencia Port Community System (IT)
6. Environmental Management
7. Safety and Security
8. Quality Management
9. Training
10. Corporate Social Responsibility.

For this literature review proposed academics by the company such as Mary Brooks, Peter De Langen or Theo Notteboom from the port industry are used as well as academics across different industries. The literature reviews will be published on the Institute's **website** and updated constantly until the end of the project.

During their research GIL discovered that other ports have best in class characteristics in different areas as well on their way towards collaboration, community and clustering. To finalise their results and to eliminate the information gap an in depth description of those characteristics in form of **case studies** have to be collected. Those case studies gathered for the project to eliminate information gaps will demonstrate the strengths of the chosen ports as well as they will give an idea of how likely those other ports are to become a cluster. Those preliminary findings will be published successively on GIL's ports research **website** even beyond the duration of the project

since this is a very long process that could not be finished during the project. These ports are all unique and successful in different ways, their experience will become a strong voice to speak for all the port authorities around the world. All ports included in the Institute's research so far are shown in the map below.

Figure 1: All Ports Included in the GIL Research



Own demonstration.

However, before the case studies and the literature review will commence a process map on how all the information already available will be processed and how it will flow into the output GIL wishes to achieve.

1.3 Market Analysis

The Global Institute of Logistics is a corporate university in the field of maritime logistics that bridges best practice and the latest in academic thinking, creating value for both ports and academics.

Ports

According to Panayides et al. (2008) ports are a "part of a cluster of organizations in which different logistics and transport operators are involved in bringing value to the final customer" (Panayides et al., 2008). Many different stakeholders operate within a port and contribute value to the customer, which are companies such as Tesco, H&M

or Volkswagen. For all those companies ports represent one logistics node within their supply chain representing the origin and termination of the transportation over sea. Ports are therefore a junction of different transportation modes where transportation on sea is connected to a different mode of transportation such as feeder service, rail or truck.

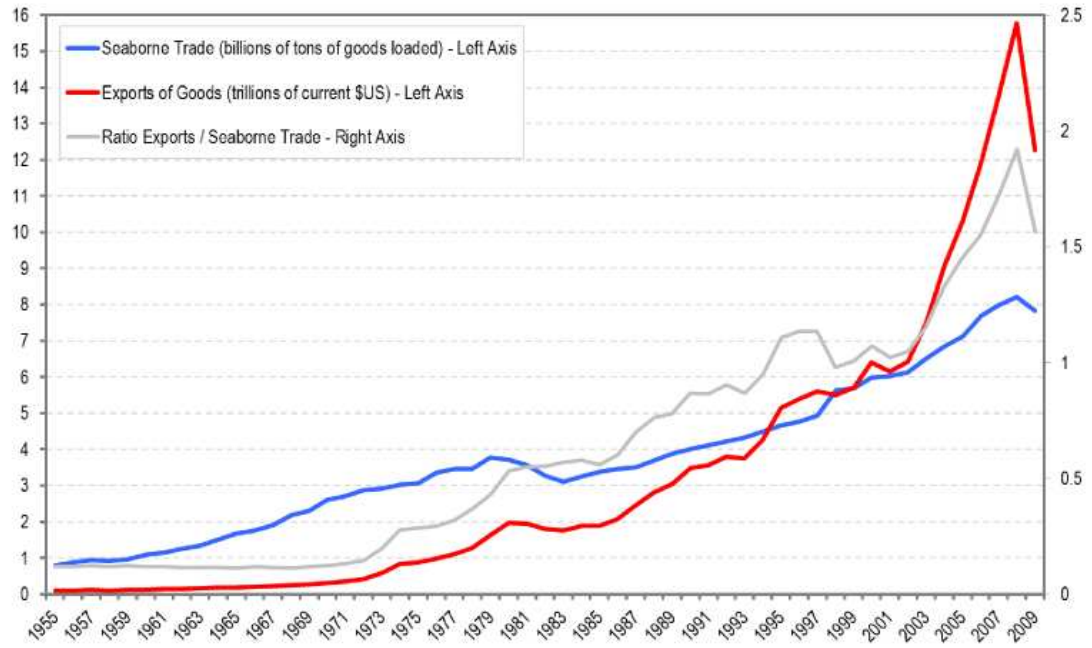
The port industry is a very significant logistics industry considering that about 90 per cent of world trade are distributed over sea by ship. Most important and significant players in the port industry are the shipping lines and terminal operators. According to Notteboom (2008) the number of port players has decreased tremendously while at the same time their market share has increased making the few shipping lines and terminal operators very powerful (Notteboom, 2008). This causes inefficiencies in a port community due to the inequality of authority and financial power. Operations are not provided in the most efficient way but in any way since no other port member has the power to stop the way of working of the few powerful companies.

Over the last decades rivalry has changed in the port industry. There used to be just little competition between ports due to low port-related costs. But the increase in global trade and the increasing significance of ports as well as rising costs have led to intensified competition between seaports. As a result this triggers the need for efficiency and drive for improvement. However, due to the different power distribution this provides ports with a big challenge.

Current Trends

During industrialization companies started to specialise their workforce in order to achieve higher efficiencies. Specialization, however, did not stop there. Nowadays it is noticeable that countries specialise more and more in what they are very good at in order to use their assets most efficient. Germany for example produces high value machinery and cars, Asian countries provide reliable high technology as well as cheap labour and Arabic countries provide the world with a large amount of oil. This trend results in an increased exchange of goods between nations. Therefore, every country exports and imports goods to a certain amount leading to increased transportation globally as represented in the figure below.

Figure 2: Correlation between Exports and Seaborne Trade

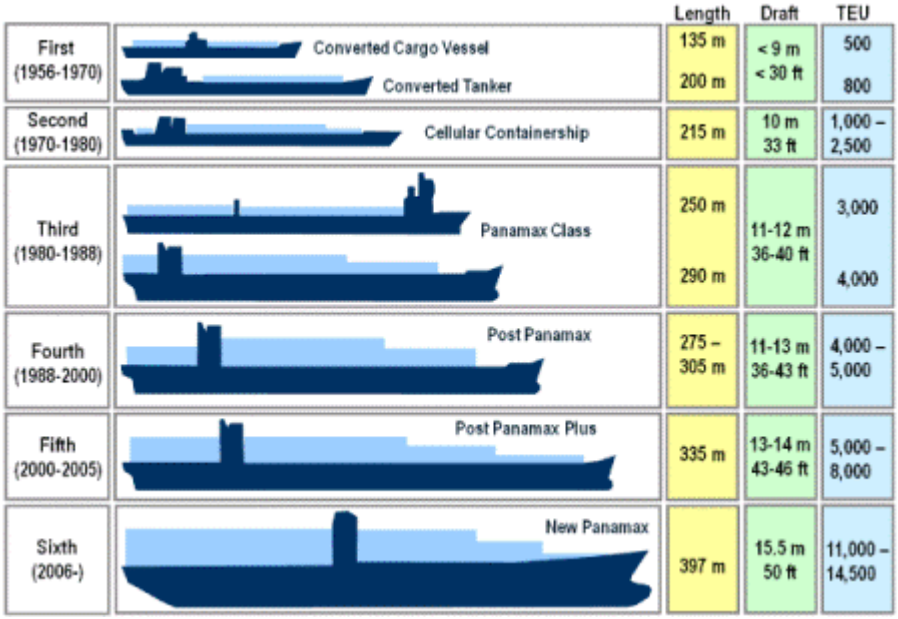


Source: World Bank. United Nations, Review of Maritime Transport

Furthermore, mainly due to the emergence of countries in Asia, South America and Africa providing a great economic reason for globalization the demand around the world has increased tremendously further triggering global transportation. Also, emerging countries usually offer a cheaper workforce especially in labour intensive manufacturing, which prompts many companies to outsource parts of their operations to low cost countries such as China, India or Mexico. This extends the supply chain of many companies resulting in increased global transportation. Also resulting in this trend is the emergence of manufacturing within a port. Many ports offer value-added activities and the sea route is not solely used as a transportation mode but also as an assembly line.

Another current trend are the increasing sizes of container ships as seen in the figure below. In order to achieve lower per unit costs a new era – called “Gigantism” – has started leading to higher transportation volume. This also means that on land operations in a port need to become more efficient in order to cope with the increased amount of goods or container arriving at the same time. Another reason that calls for higher efficiency on land is the lower speed of container ships (by around 10 knots) that is supposed to lower the use of fuel and increase sustainability.

Figure 3: Container Ship Generations



Source: World Bank. United Nations, Review of Maritime Transport

2 COMPANY ANALYSIS

2.1 Company Overview

The Global Institute of Logistics is a not for profit corporate university that connects the academic with the business world by researching on end-to-end integration and visibility in the global supply chain, passing on the latest in academic thinking to the business world while using the practical experience from those early adopters. The aim is to become a leading corporate university financed through membership, developing best practices with the members and provide a platform for sharing, learning and benchmarking. The value for members is that they will be supplied with latest ideas and developments in the port and related industry and achieving best in class operations awarded by the Institute with the Marqua de Garantía.

Momentarily, the Global Institute of Logistics collaborates with 13 ports (as shown in figure 1) and different academic institutions such as the Fundación de Valencia, the Hofstra University, the Shanghai Maritime University and many more.

Therefore, the Institute conducts research in the field of global supply chain as well as logistics and has dedicated its latest research to the global maritime logistics and more concrete to the port authorities and relationships between port members. Research is done by building a network around the world, gathering information from involved companies – in this case ports – as well as interviewing academics and validating findings from practice. Findings are successively published through reports and the new established website letting future members know what is going on and what the latest research results show.

Since the founding by members of the Global Logistics Forum in 2003, the Institute has spread all over the world such as Asia, Europe and North America. The Institute is led by the current CEO Kieran Ring under the Chairmanship of Robert V. Delany.

The company is a thought leader in the field of logistics and momentarily in the port industry. Present research has led to their understanding that especially globalization requires new ways of operation within a port community to improve logistics and therefore supply chains. An improvement in performance has to be achieved in order to deal with new and challenging developments in economics such as the increased

trade volume and the emergence of especially the so-called “BRIC” countries (Brazil, Russia, India and China). According to GIL supply chain members cannot be seen as silos but need to be evaluated as a whole as the performance of the port is perceived in a combined manner for end customers. Therefore, reciprocal accountability has to assure a good performance of all members requiring improved communication, cooperation and clustering as a way to achieve a good performance.

On their way to those findings GIL has achieved many successes that helped leading to this conclusion. One of the first developments by the Institute and tool for reciprocal accountability was the Container Terminal Quality Indicator (CTQI). It helped making Container Terminals performance measurable and therefore comparable. Many ports have adopted this technique and subsequently been granted the certification of CTQI. Current research is dedicated to the automotive terminal quality system (ATQS) providing another standard and way to measure and therefore improve performance for future members.

Further research however has demonstrated that Container Terminals do not have the control and power but that port authorities are evolving to become the coordinators of port operations. Within a research period from 2007 to 2011 the Valencia Port was identified as the Best in Class and led to the development of the Port Cluster Governance Committee (PCGC). Over the years many other ports around the world have become members of the Committee. Currently there are 12 members on the committee. The committee is divided into the Asian, the European and the North American chapter. Membership is by invitation and all members of the PCGC have to demonstrate best in class characteristics to be chosen.

Momentarily, GIL occupies four employees. However, due to the increasing acceptance of the Institute’s research and the associated growth prospects, the company is in need of many more employees.

2.2 Issue Analysis

GIL has been collecting information of ports around the world over the past four years and has to transform all collected data into a presentation held on October the 14th, 2011 in Shenzhen. The challenge faced by the company is the transformation process since so far no experience in transforming the information in such a big scope has been gained. Also, the research results are supposed to attract members in order to becoming a membership company. Therefore, the first step is to organize all the information including the research period of the Institute and its findings as well as what to do with all the rather practical findings so far and how to use and implement them in a port. The information is put in a logical order in a process map explained in the following.

2.2.1 Process Map

The supply chain issue faced by GIL is the transformation of the information they possess. All the information is considered to be the input of the Institute consisting of media, corporate, academic as well as GIL research. So far all information collected is available to the Global Institute of Logistics in form of files on their computer, in form of a huge global network of academics and port businesses around the world as well as in form of journals and reports. Many of the information is available multiple times containing the same information in different ways. Further, an appropriate way to process the information is missing. Therefore, GIL only possesses the inputs and the desired output to their supply chain but lacks a proper way of transformation and validation.

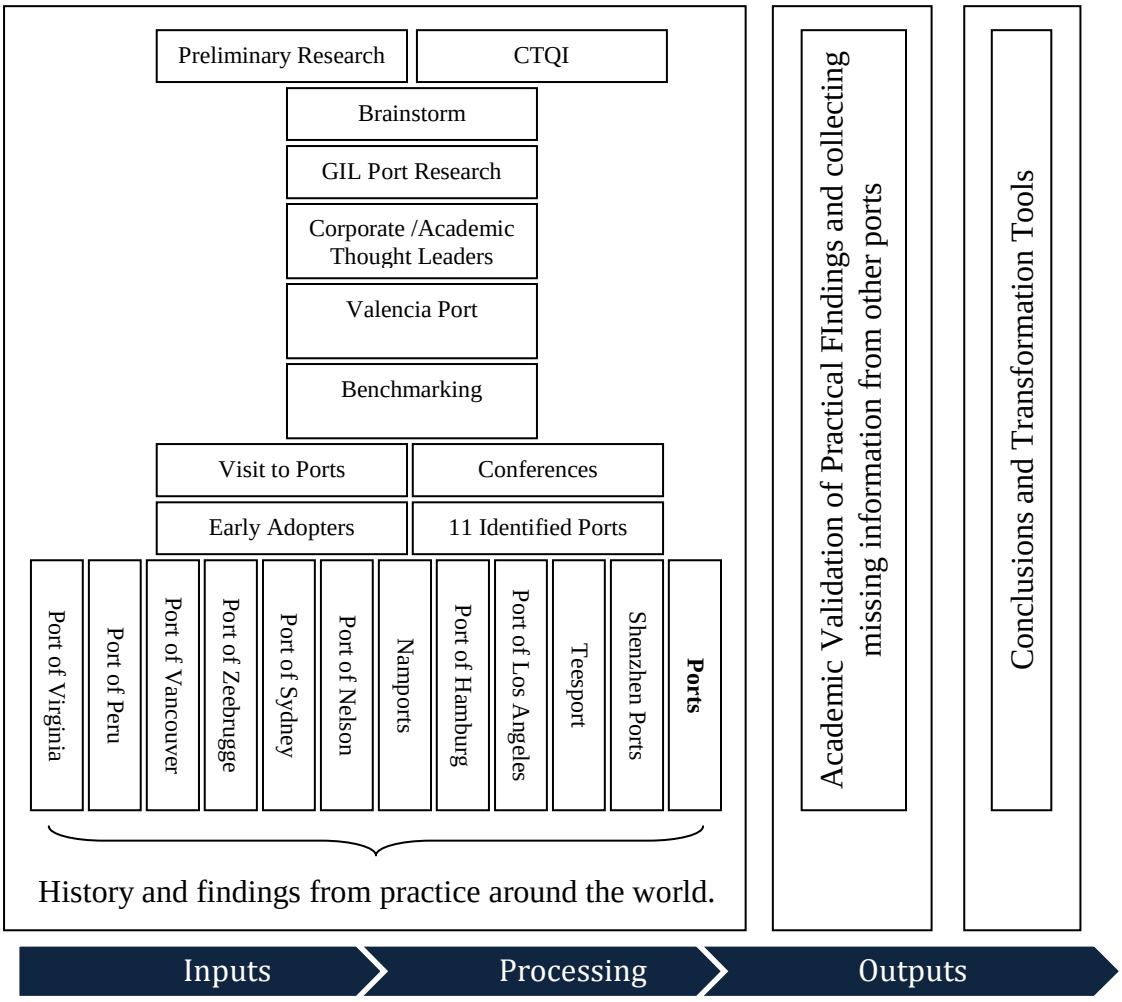
Therefore, the first step in the project is to build a process map showing the possible process to be taken to achieve the desired output. This includes determining the inputs properly and finding appropriate transformation tools that can lead to the output which is a **change** in thinking in the global maritime logistics industry which will be disseminated by motivation, mobilization as well as adaptation which contains a the implementation of certain standards of processes such as CTQI for example.

The process map helps understanding the research history of the Institute and leads to a logical next step of validating the practical findings. The practical findings together with the academic and rather theoretical validation will lead to the transformation

tools for ports emerged from practical experience from many exemplary ports and other industries.

Due to the very dynamic process and development the process map has been updated as the project matured. Figure demonstrates a final simplified version of the process map.

Figure 4: Simplified Demonstration of GIL's Knowledge Process



Own demonstration.

The process map is the first step to take in order to get an idea of the next tasks in the project. To create the process map all inputs need to be identified which requires many meetings with GIL. After having observed all inputs and reviewed the steps GIL had taken to get all information the decision was to determine the goal in order to decide on a proper way of transformation.

Challenges are the huge amount of different sources that GIL used. They range from visits to ports, over conferences and network building to the research of academic

thinking as well as the use of media. Also a lot of ideas on how to transform all the inputs into a change of thinking in the port industry exist. However, the best way has to be found to first bring all knowledge in order and to make it easily accessible and understandable by the target market – the port and logistics industry.

The information GIL was able to obtain represent the inputs or sources and the Institute's goal represents the output.

2.2.2 Information Gap

The Institute has done a lot of research done on the Valencia Port and has got a detailed case study on the contained modules. However, the research conducted by the institute contains also other ports that have not yet been examined as detailed and therefore, there is still a gap of detailed information from the additionally identified ports with best practice characteristics regarding how they address the current trends and cope with the challenging economic environment as well as detailed information on their best practice. As a result, the second issue faced by the company is to fill this gap.

To close the information gap ports need to give information that can be divided into certain detail levels. After assessing all information needed by GIL, it was decided that a information will be gathered using questionnaires asking for macro information first. Those questions include the throughput of a port and the general port type. More detailed questionnaires contain interview questions with personnel from the port that have a deeper knowledge of the port structure and processes. The questions with the most detailed information will be in form of a case study for which a special structure is required.

After having decided on questionnaires, the question is how to process those questionnaires. Different possibilities are considered. The first option is sending all required questions and forms to the port and having them answer the questions and sending them back to GIL. Another option is to put them on the new founded website. The new website is supposed to have a website for each port and by securing each port site with a password it can only be accessed by the individual port and all information required by GIL can be seen (more details on the website in the next section).

It has been decided on using the website to complete the information due to it being a more efficient and less time consuming way. It also allows a more personal contact platform since addressed people will be led through the website. The results from the questionnaires will be published on the website. So far there are no responses and just one questionnaire could be send due to the process of creating the website.

By closing this information gap GIL will be able to analyse the findings and finish their research. For this issue a questionnaire was established and published on the website providing each contact person at each port with its own work space on the website, making this process of data collection easy for the Global Institute of Logistics as well as for the ports.

2.2.3 GIL Website

On the GIL website all findings will be presented as well as it will be the tool for collecting case studies and the literature review. The Website will emerge throughout the project and beyond. All findings will be represented on the website and accessible for port members. The website will be finished in October for the conference.

Another issue faced by GIL is to understand how the best in class – the Valencia Port – has addressed the changing competitive environment as well as changing economic issues and trends and how they have answered this challenge as well as how, by mastering this challenge, they have become best in class. A literature review of the identified overall best practice – the Valencia Port – will analyse the academic thinking and point of view behind the Case Studies. It will also help understand the research conducted by GIL and finding an answer to it by a best in class example. The literature addresses all modules within the Valencia case study listed as follows:

- The Governance Model
- Cluster Leadership
- Infrastructure Planning
- Marketing Hinterland
- IT system
- Environmental Management
- Safety and Security
- Quality

- Training
- Corporate Social Responsibility.

The literature review will validate GIL's practical findings and proof the importance of all those modules not only in the port industry but in business nowadays as a whole. The literature review will demonstrate that all those topics are trends of increasing importance in the current business environment in order to cope with issues such as new markets through emerging countries, the associated increased global trade and a need for increased efficiencies. The literature review also includes best practices from other industries and sets out the importance across industries.

To publish all the academic findings and thoughts the GIL website is used and an academic workspace is created. So far there has been no academic website but it will be to firstly acknowledge academics that had a great impact on the Institute's research but also to publish academic findings in the context of the ports research. The Academic Research Website will include a literature review as well as an overview on the academics that have shaped GIL's train of thought as well as its research. So far little has been done on the academic research website and therefore more detailed information will be given in the final report. However, a first draft of two out of nine topics from the literature review are presented in the following.

The literature review provides knowledge and helps the readers to gain an in-depth understanding about the process and the outcome. It has always been a challenge for organisations to change their administrative model . they may had realised there is the need to change for the better solution but lack of information and knowledge are often the cause for them to delay their progress.

The Valencia case study tells a real life success story. Their success was not done just over night but thousands of days and nights of hard work. They have been through a hard journey to become the best in class. However, the case does not provide information on what has lead the Valencia Port to make the decision and take action. For this reason the case study will be analysed or back engineered and linked to academic research on this topic as well as across industries. The information/knowledge gathered by re-engineering the Valencia case study will fill this gap for the readers. the knowledge will be presented in the same order like the

Valencia case study so it will be easy for readers to follow and understand the trend of knowledge.

In the following, the literature reviews are represented.

1. Cluster Leadership

To many companies ports represent a black hole in their supply chain due to the loss of control over products and uncertainties regarding lead times. This is mainly due to the small amount of cooperation between members of the port community that as a result are operating as Silos. However, according to many research and seen on examples such as the information technology (IT) in Silicon Valley, the film industry in Hollywood or the finance industry in Wall Street clustering is an increasingly important theory providing competitive advantage by, according to Porter (1998), providing cluster members with knowledge, relationship and motivation triggering innovation (Porter, 1998). According to Porter (1990) Industry Clusters are "geographic concentrations of interconnected companies and institutions in a particular field" which is exactly found in a port. In this case the question arises that if other industries are able to draw their benefits out of clusters why are most ports not able to do so? Even though all members of a port work together interdependently in one industry within a close proximity they are far away from working as a cluster and creating competitive advantage or an increased value for customers.

According to Bozarth et al. (2006) a cluster provides the benefits of access to specialized human resources due to increased opportunities for employees and higher mobility (Bozarth, et al., 2006). Porter (1998) argues that due to the close proximity of companies from the same industry special knowledge and information can be shared more easily due to a development of trust among the cluster members which as a result triggers innovation. The author also claims that complementarities, that arise from members of a cluster having similar needs, can be shared. In the case of ports that could be for example training of employees. Instead of every company within the port doing their own training this could be a shared value for several port members. The author further claims that the accumulation of many different rivals in one geographical area leads to high motivation to continuously improve their performance and offerings (Porter, 1998). In a port community there are often found more than one, for example, container terminal operator offering similar services and competing

against one another. However, this may improve the overall performance of the port if this competition is used in a positive way to trigger innovation and improve services.

In Porter's "The Competitive Advantage of Nations" (1990) the author explains that competition within clusters is important and fosters innovation since companies will innovate in order to differentiate themselves from rivals within the cluster. Porter's Diamond

2. Governance and business Model

Knowledge gained in this part is mainly focused on the reason and need to change governance model and the outcome after the change. The literature and knowledge in this area is mainly come from the work done by Dr Mary R Brookes and Dr Peter De Langen.

The Governance Structure of Ports

The governance of ports globally has changed significantly over the past two decades, much of it as a result of government devolution programs. Rodal and Mulder's (1993) defined devolution as "the transfer of functions or responsibilities for the delivery of programs and services from the federal government to another entity," which may be "Another order of government or a non-governmental organisation, community group, client association, business or industry." (Rodal et al., 1993).

Devolution programs are part of a recent trend toward alternative service delivery (ASD). This reform movement, which has taken place over the past decades, is a response to at least two drivers of changes. First, rapid improvements in information technology have increased the transparency of government operations, providing citizens with greater ability to monitor and participate in government activities (Ford et al., 1997; Rodal et al., 1993). Second, throughout the late 1980s and into the 1990s, increasing deficit and accumulated debt burdens (Ford et al., 1997), coupled with low level of public confidence in government, forced governments to find ways to do more with fewer resources (Osborne et al., 1992). Such thinking has been a key driver of the movement towards port "privatization" in many countries.

The change of administrative models

The World Bank port reform toolkit (WBPRTK) outlined four port administration models; which are the service port, the tool port, the landlord port and the private

service port. The choice of the model adopted in each country is influenced by the way ports are organised, structured and managed. However, in the recent decades, extensive port reforms have challenged the conventional models of port organisation, the traditional landlord/supervisory role is no longer effective for port management. One of the key reasons is the role played by port authorities (Brooks et al., 2004). Government in both developed and developing countries start to adopt alternative service deliver models and devolved port operational responsibilities and sometimes port assets to local public entities or to private and/or commercially driven port entities (Cullinane et al., 2007).

In the landlord model, the port authority maintains ownership in the port while the infrastructure is leased to private operating companies. This activity has limited the port responsibility to a certain range. The responsibilities of port authorities as landlords include economic exploitation, the long term development of the land and the maintenance of basic port infrastructure.

Notteboom et al. (2002) included in the notion of governance the management of stakeholders' relations (internal, external, public policy and community) concentrating on the logistics integration in port. De Langen (2002) suggested that the mix of the stakeholder management in a port cluster would add to the understanding of port competition and performance and port authority should play the key role in the cluster (De Langen, 2002). Clusters are geographic concentrations of interconnected companies and institutions in a particular field (Porter, 2003). The Drewry Shipping Consultants (1998) put it like this: "The modern port can be described as a community of independent enterprises tied together by a common interest in maritime affairs. Central to this community is an entity known as the port authority, always a regulator, usually a landowner, often a developer and sometimes a terminal operator" (Drewry Shipping Consultants, 1998). This demonstrates that the role of port authorities in port clusters is differing from their role as landlords. In a cluster environment it is claimed that the "institutional position" of the port authority can be described with the term "cluster manager". For this reason, it can certainly be assumed that collective action regimes in port clusters are relatively effective compared to the traditional administration model (De Langen, 2003).

Landlord ports are (in general) self-sustaining and non-profit organizations. The revenues of port authorities are related to the performance of the cluster as a whole:

revenues from port dues and lease contracts go up when the cluster performs well. Cluster can be found in many of the business environment but seaport clusters are special because of the prominent role of port authorities. In many other clusters, such as the Dutch maritime cluster (De Langen, 2002) the shipbuilding cluster in the Northern Netherlands (Van Klink and De Langen, 2001) and Silicon Valley (Hall and Markusen, 1985) a central actor with a similar set of incentives, resources and a similar institutional position is lacking. Therefore, cluster management is likely to be more advanced in seaports than in other clusters.

3. Infrastructure planning

Evolution

Several evolutions have taken place in port infrastructure during the past decades. Not just in terms of the technology such as: construction, cargo handling and automation etc. but also in the area of strategy planning. Looking back to the history new infrastructure was built only when there was a direct need for it and the decision process and construction time were relatively short, and that in an era where the transport sector did not change often. Today, many of the challenge come from where decision processes take very long while the opposition asks for fast solutions (Evertse, 2008).

There is also a change over time in conditions and requirements that need to be fulfilled before port infrastructure can be constructed. In the last century the port infrastructure was built ‘on stock’. Port area and port basins were constructed long before any stakeholder had shown interest to lease a spot of the land to do their business. This activity had created many conflicts in the current business environment for port authorities, as what they are or can provide to their stakeholders and potential customers is no longer satisfying their requirement for business activities (Dooms et al., 2007).

Port infrastructure planning within the cluster

Port planning exercise is the process of identifying the future demand and necessities of port services with the objective of defining the configuration of a service supply which is feasible and sustainable. The crucial step in port master-planning is to formulate a clear long term vision. The key feature here is that this plan has to be shared and agreed on by all stakeholders in the port or by port users. Then port

authority will lead the direction for all the port related activities. Without long-term vision, decisions made presently can block future development of ports (Dooms et al., 2007).

The planning and development port infrastructure requires a broad and integrated approach, in which the following elements can be considered as most important areas (Evertse, 2008).

- Traffic forecasting:

Ports should consider the characteristics that will distinguish themselves from others in the long term planning vision. This can be established through the execution of a SWOT analysis where port authority can be used to analyse the results to determine its position. A well conducted traffic forecast provides good estimates for the development of good traffic in the ports (Klaver, 2007).

- Space/clustering

Both space and land are crucial factors which need to be considered in the economic development process (Dooms et al., 2007). Clustering is recommended in this translation process as it will create the maximum synergy for the operation. Harvard professor Michael E Porter is considered the founder of the modern field of business strategy. He highlight that important factor that cluster can faster the high levels of productivity and innovation and lays out the implications for competitive strategy. Cluster is one of the key characters in today's economic world. Critical masses in one place of linked industry activities and institutions from supplier to universities to government agencies that enjoy the unusual competitive success in a particular field. Porter explains how cluster will affect the competition in three ways: first, it will increase the companies' productivities within the cluster. Second, it can drive the direction and pace of innovation. Third, it will stimulate the formation of new businesses (Porter, 1998).

- Hinterland connections

The competitiveness of the port relies to a large extent on the quality and cost of the transport links (Chopra et al., 2001). Therefore, there has to be extra infrastructure in place in terms of transportation from the port into the hinterland to meet the demand which is not solely in the port area but mainly in the land behind the port. It is as a

result the great responsibility of ports to be able to obtain the sufficient support from the state or national government to invest in the port itself and also in the infrastructure related to enhanced hinterland connectivity of the port. Port authorities obviously can be the key figure here to drive collaboration.

- Environment and added value

The translation of the traffic forecast into the port infrastructure projects has environmental implications (Dooms et al., 2006). A healthy environment is becoming an increasingly important business location factor and therewith offers a competitive advantage for Ports. There is a hidden indirect element within the environmental development, which refers to the activities which do not automatically arise from the service available in the port complex, but for which the presence of the port does constitute an essential condition (Van Hooydonk, 2006).

4. Marketing Hinterland

The word 'hinterland' was borrowed from German, where it means literally the land behind the city, a port or similar, with the English cognate hind land (Wikipedia). It was argued by Van Cleef that "geographers have not agreed upon the definition of hinterland or even its meaning, though it is a word of long standing (Robinson, 2002) however, one element all definition of the hinterland have in common is their spatial focus and it is widely acknowledged that a hinterland is the area which a port draws most of its business. Seaport serves hinterland. Many of the inland modes like road, rail, are used to access the hinterland. The quality of those accesses to or from the hinterland differs between seaports and affects their capability to compete with each other (Notteboom, 1997). Since there has been a tremendous changes in the world of logistic, port hinterland have become a key component for linking more efficiently elements of the supply chain, namely to make sure that the need and demand from suppliers and customers are closely met in terms of cost, availability and time in freight distributions (Notteboom et al., 2001). Therefore, it's easy to see that ports have to be able to copying with a very flexible environment.

Globalization has brought many major challenges into the world of maritime transportation. Particularly it had put pressure over the hinterland which has received renewed attention in the last decade, but if we take a close look at the researches been done in the hinterland area the result shows that at the end of the 80s, research on the

issues of hinterland waned (Notteboom et al. 2005) this development was caused by a number of factors. First, the conceptual term of hinterland has become increasingly difficult to reconcile with the dynamic nature of maritime shipping. Second, for the logistic market development, the discontinuous nature of complex logistic networks had enabled the emergence of cluster hinterland. The traditional perspective based on distance-decay is no longer being able to address the new reality. What is needed the most is a more functional approach to deal with the new concept of hinterlands, most important for its integration with issues related to logistics and supply chains.

There are three basic sub-components would help us to understand what the hinterland have become today in terms of its spatial and functionality. The three components are: macro-economic hinterland, the physical hinterland and the logistical hinterland.

Elements and attributes of the three types of hinterland

- The macro-economic hinterland

The macro-economic hinterland is a matter of transport demand. It represents a set of logistical sites which focusing mainly on production and consumption. The macro-economic hinterland today had grown beyond the consideration of the clients of the port, either existing or potential. Globalization had caused additional macro-economic issues need to be considered, such as interest rate, prices savings productive capacities and so on. All of those issues are often been considered within the concept of port forelands and hinterlands. In the current global market environment the structure of international trade has become fundamental to port hinterland relationships. Port hinterlands around the world have been affected by the power of macro-economic forces. Since international trade is rarely a balanced account, trade imbalance especially at the regional level, have a significant impact on port hinterlands since they impose a general direction in traffic flows completely outside the level of intervention of ports.

- The physical hinterland

The physical hinterland is a matter of transport supply. It considers the network of transport infrastructure, modes and terminal connecting the port to its hinterland. The transportation facility within the hinterland has become particularly important for this type of hinterland as its serves as it links the global access of the port within regional

customers (Paris Economic Research Centre ECMT-OECD, 2001). Port hinterland is physically connected by port ranges and gateways. Ranges can be seen as lateral corridors of port competition in which gateways provide access to inland freight corridors. The significant number of containers been handled by ports in recent years provide a strong indication of globalization. It shows the growing physical capacity at the terminals, and also at the hinterland.

- The logistical hinterland

The logistical hinterland is a matter of flows, how the macro-economic and physical setting are organised and how they are taking place is their main concern. Other main focus includes the issues like modal choice and inland freight so on. Global supply chain is largely determined by the performance of logistic networks as they connect production, distribution and consumption (Hesse et al., 2004). As a result of the mass customization those logistic networks are highly dynamic and flexible in order to be able to response to product and market segmentation, lean production and associated reduce/decrease in cost.

- Port authorities and the hinterland

The traditional landlord port authority can be seen as an independent commercial undertakings aiming at full cost recovery and a quick response to its customers. The port managers are more interested in make the port become more attractive to their existing or potential users, by providing a set of competitive services for carriers and shippers. Due to the nature of their revenue resources which are mainly comes from their local region, port authorities tend to put their focus strongly on the activities within the port perimeters that would help them to increase the revenue base. Landlord port authorities throughout Europe are facing some great challenges in respect to the hinterland connections. Many of the market players had become very active in setting up inland services and hinterland networks. Market consolidation has made the situation more difficult to handle as some of the large port clients possess a strong bargaining power when dealing with terminal operation and inland transport operations.

Port authority have a role to play in shaping efficient hinterland, and they need to focus on the areas would affect the cargo flows and hinterland infrastructure development. Most port authorities are still taking the backstage position when it

comes to inland terminal development and the creation of logistic zones along hinterland corridors. Notteboom (2008) believes there are three reasons indicates that it's time for the port authorities to change their attitudes.

1. Port authorities should understand there is possibility that port benefits might leak to the inland users once the logistic poles are created. The strategy that is only focus on the local area will not sufficient enough to address this threat in an effective way. Only the active port regionalization strategy will make it possible to re-shape the logistic networking.
2. Most of the port users have their attention on the logistic network development. Port should be able to maximise their capability to fill into the networks that shape the supply chains.

Port authorities are now facing a much wider array of constraints (road congestion, lack of availability in land, environmental issues) therefore; ports have to give a high level of environmental performance and sustainability not just to gain the support from the community but also to attract more trading partners and potential investors.

5. IT Support

Nowadays all companies are supported by information technology (IT) systems. No company works without it. The development of IT systems has provided companies with huge cost reductions in paper intensive work. However, with the extension of supply chains and increased need for information sharing a much more complex IT support is required. Nowadays companies look for a single source of data in order to have a more transparent, faster and more reliable information flow. Within a port community this would be a very significant improvement as the best in class Port of Valencia has demonstrated. The port managed to connect different businesses within the system and provides an exceptional example in the port industry.

"Definition of systems is significant to definition of information. For instance, information is that intellectual that in a certain domain can be acquired, preserved, transferred and applied as non-empty sets of information elements, and the aspect entity will be determined in each element" (Long, 2003). "The definition of an information system should then be a system which will be able to manage the knowledge". Lambert (2004) defines information systems as "a system for collection, adaptation, storage, transfer and presentation of information, for the use of the

information system, effective way. Traditionally, information systems have been considered primarily in terms of their effects on individual organisation, Researchers have concentrated their effort on delineating the nature of the information function (Quillard, et al., 1983). Such as operational support versus decision support, the impact of information systems on end users, or the importance of the information system to an organisation as a whole (Rockart et al., 1983). However, the extraordinary use of information system as competitive weapons has been under consideration.

Today, many of the sectors are facing global challenges that cannot be met without support by information technology on a level even beyond today's advanced IT utilizations. However, emerging technologies and their integration open the way for the development of integrated digital environments that could provide platforms for a reorganisation for sector activities, and market related activities, capable of coping with the challenges ahead. Information technologies have the potential to support the organisations in coping with the challenges but they are also key enablers for some of the developments to take place. In today's business climate, the drive towards globalisation depends on modern communication technology. But the difficulty in anticipate the technology evolution and its effect is compounded not only by its rapid change but also depending on the decisions of investment, acceptance, adoption and rejection (Schiefer and Zazueta, 2003).

E-Business and Supply Chain Management

E-business arose through the proliferation of the internet as a platform for inter-organisational systems in the late 90s and had played a significant role for the developments in the operation and strategic management of supply chains and networks (Evans and Wurster 2000). E-Business involves web-based technologies to support company operations (Cagliano et al., 2003). The study of e-business technologies is different from the broader meaning of information technologies (Sanders, 2007), can be defined as technological capability used to acquire, process and transmit information for more effective decision making relative to competitive standards (Grover and Malhotra, 1997). Hence, e-business can be considered a subsection of information communication technology. Investments in e-business then can be distinct from traditional information communication technology investments because it carries greater risk and reward. Kohli et al. (2003) identified two main

characteristics of the e-business environment. First, e-business environments are generally more volatile and therefore prone to high level of risks. Hence, information communication technology investment is the result of a well-planned strategy. It needs to be closely monitored, even more so than other investments. Likewise, they offer extraordinary opportunities that, when managed appropriately, can yield significant gains as well as long-term competitive advantage. Second, by their very nature, e-business applications are cross-functional and span traditional departmental boundaries.

The rise of the internet as a communication Channel and its supporting systems and software has changed the economics of information; provide more opportunities, new connections between organisations, new form of relationships between organisations and also new forms of transactions between organisations (Evans and Wurster, 2000). Inter-organisational electronic networks had improved co-ordination between firms to reduce the cost of searching for appropriate goods and services, one of the major effects of inter- organisational networks would be the great movement from hierarchical to market relationships (Malone et al. 1987). The impact of e-business on the supply chain is recognised in the information strategy literature Galliers (1999) ,pp.229-230):

. . . With the advent of inter-organizational systems, and e-commerce in particular, it is clear
That questions of alignment go beyond what we have come to know as the business – IT
Alignment issue (e.g. Baets, 1992). It is no longer simply a case of internal alignment alone.
Such issues now include alignment with collaborating companies' business and IT strategies
(Finnegan et al., 1998) and customer requirements (recent heightened interest in customer
Relationship management).

E-business has a significant impact on level of analysis issues in management research; it had broadened the perspective to analysis of supply chains and network. A major impact of e-business is its role as a mechanism for improved control of supply through collaborative planning, forecasting and replenishment (Frook, 1998; Lewis,

2001). An integrated control system supported by e-business infrastructures allows companies to benefit reduced total cost and increased service to customers (Papazoglou et al, 2000).

Information Systems and Supply Chain Environmental Performance

Industries such as transportation and logistics have been transformed by information and information technologies (Kohli and Melville 2009). From a sustainability perspective, an information system enables the organisation to standardize, monitor, capture, and utilize data that controls the energy efficiencies. Information system has been critical to supply china activities by improving information flows and creating new sources of value (Banker et al. 2006; Cachon and Fisher 2000). Trading networks trading networks might actively address sustainability by collaborating to promote environmental standards that they jointly develop (Bakos and Nault 1997; Clemons and Kleindorfer 1992).

6. Sustainability – Environmentalism

Sustainability is not just a current trend but an increasing concern that affects all people and businesses around the world. Global warming and a related increase in the number of natural catastrophes, starving people in parts of the world where some of the richest companies source their materials from and the scarcity of natural resources require collaboration of all people as well as a serious consideration of the consequences human activities have on the named issues. Research states that cargo container ships can have about the same impact on human health as 50 million cars (McCue, 2011). According to the Brundtland Report (1987) sustainability is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Report, 1987). Over the past years many companies have invested in sustainable related activities such as reforesting or plans for reduced emissions.

Against the often heard opinion that becoming "green" will put companies at a competitive disadvantage, many corporations have proven that sustainability can be a profitable way and a key driver of innovation (Nidumolu et al., 2009). Other incentives to invest in sustainability are the increasing costs of resources especially in terms of material and energy as well as increasing public pressure. While public pressure makes companies and in this case ports react, ports might be better off taking

a more proactive role by becoming a fist mover which, according to Nidumolu et al. (2009), will lead to competitive advantage since in the end, there is no alternative to sustainability. Therefore, ports should start building up competencies sooner than later in order to be ahead of competing ports that still view sustainability as additional financial costs instead of a chance of being innovative (Nidumolu et al., 2009). Further, government regulations concerning especially environmental issues are increasingly inaugurated and the better a port acts anticipatorily the easier and faster it is for it to catch up and leave competition behind. Other suggestions by Nidumolu et al. (2009) and Kleindorfer et al. (2005) concern operations. Many innovations in ports have been made into the right direction. One example is the cold ironing as described by McCue (2011) which refers to using plugs as a power source instead of diesel engines once a ship has docked (McCue, 2011). This method was introduced by the Navy and is now successfully used by the Los Angeles Port.

Most of the time, sustainability is associated with being green and environmental friendly. However, the term sustainability includes far more as the definition above already signals. According to Kleindorfer, et al. (2005), sustainability contains the relationship of people, profit and planet – the so-called three pillars – in which a company should invest in order to win the trust of employees, customers and communities (Kleindorfer et al., (2005). People refers to the social capabilities of a company internally as well as externally. Profit refers to financial sustainability and is very important for ports since it is a critical component within the port community and not all ports have reached this independency. Especially for ports it is important to be financially self-sustainable in order to compete properly and not over depend on government. The planet component concerns the relationship between company or port activities with the environment. In relation to ports this may especially be the effect on the marine environment, such as waste in the water, and the use of natural resources, such as fossil fuels.

But how can a company become sustainable and how can ports reach a total integration of sustainable management? Many companies have shown that sustainability is very well able to be aligned with business activities. The topic is probably the most discussed issue in the moment over all industries and provides companies in every industry with new challenges. Many industries provide good examples regarding sustainable implementations. Unilever for example, addresses all

pillars of sustainability as they support local communities they operate in to address the people component, they reduce their environmental impact by analysing the product lifecycle and the way the products are used and by having an annual plan and very specific goals for every year in order to meet the profit component (Unilever, 2011).

However, ports face an even bigger challenge. Firstly ports have not yet felt that much pressure from external stakeholders such as the government, maybe due to its important function as an economic facilitator. Secondly, ports are located between the sea and the landside representing a bridge or connection for both sides and especially face more complex problems related to the environmental dimension. But Cold Ironing, a lower speed of container ships and a reduced use of trucks in the port area represent first steps into the right direction and proof that sustainability within a port community can be achieved.

7. Safety and Security

Ports face many risks regarding safety and security issues. Among others are overall port security, facility security as well as security and motivation of employees inside the port community. But also outside this community ports as a very complex system face major issues such as protecting against piracy and securing their operations in order to facilitate and support global trade. For ports it is therefore of immense importance to secure the continuity of their operations. Attempts to improve mentioned issues have been undertaken by implementing several regulations and programs such as the Maritime Transportation Security Act of 2002, the Security and Accountability for Every Port Act (SAFE Port Act) of 2006 and several others (United States Government Accountability Office, 2007).

Safety, even if it plays an obviously important role in the port industry as a lot of heavy and big machinery is used, other industries face issues with safety as well. Many companies apply high standards and have recognised the importance – in some countries due to governmental regulations and labour unions but also because they see safety as an important issue in order to provide employees with a humane work environment.The most important asset not just for any other company but also for ports is human resource. Therefore, companies need to protect them and provide a

workplace in which employees do not have to fear to get injured physically or mentally.

Mehri (2006) who experienced Japanese company culture discusses amongst other issues the safety standards for employees working in the **Toyota Production System** (TPS). The author claims, that the TPS is inhuman and comes to the **cost of workers**. According to Mehri (2006) safety is not provided for employees and accidents happen often caused by high line speeds, poorly designed equipment and long working times. An environment like this causes workers to lose the connection to the company since they cannot identify themselves with it. It demonstrates that companies need to implement certain safety standards in order to provide employees with a secure workplace. Good training, equipment and frequent maintenance are significant in order to avoid safety and security risks with employees. Another more recent example would be Foxconn, manufacturer for companies such as Apple, Hewlett Packard and Dell. Many news last year claimed that due to safety issues starting from inhaling poisoned gases and working in an dusty environment over 11 hour shifts, seven days a week to a little pay many employees left the company or even committed suicide (Barboza, New York Times, 2010).

Other supporting literature is provided by Das et al. (2007) who links safety perception of workers and managers to performance and quality outcomes. Many managers have a different perception of safety than their workers which results in a gap, called safety disconnect. Safety disconnect is caused by cognitive dissonance which is defined as the incompatibility of information or situations. According to research employees are most likely to reduce dissonance by ignoring policies by management as long as they are incompatible with the employee perceptions. The resulting interpretation of workplace condition leads to a psychological state that influences the work performance and attitude of the employee. The author further proposes that safety disconnect leads to a negative quality performance due to deviant behaviour and a redirecting attention from quality (Das et al., 2007).

This demonstrates how important it is not just for ethical reasons and in the interest of workers but as well for the company to have high safety standards and good communication and relationship between managers or the company and the workforce. Not only does it help reducing turnover rates which in return usually

means higher productivity but it also means higher quality for the company as the latter article suggests.

8. Quality Management

Quality management (QM) has become an important management philosophy and secured a unique position in today's business society. Quality management was first mentioned by W.Edwards Deming, Joseph Juran Philip Crosby and Kaoru Ishikawa almost two decades ago (Sousa et al., 2002). Since then it has become a well-respected management philosophy in the business sector. Today, many of the companies have embedded quality management practises into their business operations and processes.

There have been many versions of the definition for quality management. The most common one in the existing literature defines quality management as a "philosophy or an approach to management" made up of a "set of mutually reinforcing principles, each of which supported by a set of practises and techniques" (Dean et al., 1994). Since quality management has been adopted by more and more organisations in the last two decades, its meaning varied strongly and became diverse to many different people (Watson et al., 1995). The agreement in the literature on what constitutes quality management, had clearly indicated that quality management as a field has indeed matured and is laid down on solid definitional foundations (Powell, 1995).

The impact of quality management on performance

One important area of quality management has been its impact on organisation's performance and the associated competitive advantage that may be achieved by the organisation effectively implementing QM.

- The Economic value

Different organisations hold different resource portfolios. These differences produce variability in performances across organisations (Wernerfelt, 1984). Although organisations may try to copy or develop resources held by successful competitors in the same industry, or at least to replicate their benefits, resources bundles remain different due to the fact that there is always something that is impossible to imitate (Lieberman et al. 1988). Under the resource review, success derives from economically value resources that other organisations cannot imitate. The quality

management dose produce value to the organisation through a variety of benefits: First, it can help the organisation to have a much better understanding of their customer's needs. Therefore, this can lead them to be able to provide a much more customised service to the customer and meet or even exceed their expectations. Second, it will improve the communication efficiency within the organisation. This can result in better problem solving, greater employee commitment to their jobs and better motivation at the work place. Better communication efficiency is especially important for ports in order to achieve higher levels of customer satisfaction and demonstrates a fundamental issue. Applied in a port it would also improve the silo based thinking and acting and lead towards an industrial cluster. On some level, employees will also develop a much stronger relationship with their suppliers and other companies which may result in improved effort and performance. They might make less mistakes at work and also reduce waste (Juran, 1993).

- Financial performance

The financial impact may vary due to the characteristics of different organisations. The success and failure of quality management implementations are often judged by comparing the actual benefits against prior expectations. First, if the organisation had set high and unrealistic expectation about what the implemented quality management procedures can deliver, even if the QM implementation had delivered good results, it can still be seen as failure. Therefore, QM allows management to adjust the problem and provide a basis for forming reasonable expectation for its financial performance. Second, by implementing a quality management system, organisations are able to estimate the amount of investments required for their operations. Those investments may include: training cost, cost of implementing new information and performance measurement systems or even improved machinery. The redevelopment of resources and other capital investments in order to improve the quality and increase customer satisfaction are other investments (Chen et al., 1995).

The most famous example for Quality Management found in literature is the Toyota Production System (TPS). Characterised by flexibility and just-in-time production reducing waste and therefore applying lean production methods, this approach is supposed to improve product quality and productivity. Since its development this concept has spread not just across continents but also across industries. Nowadays do not only manufacturing companies benefit from TPS's associated quality and

productivity improvements but also the service sector. Today many companies have realized the importance of quality management and its contributions to an improved performance and productivity. Companies such as Nestlé, Unilever or Volkswagen put much effort in supplier improvement and relationship building in order to achieve better quality. This should also be true for ports and its businesses. Tools for improvement already developed by the Global Institute of Logistics is for example the Container Terminal Quality Indicator. This helps measuring the performance of container terminals which as a result makes performances comparable and improvements possible. However, this is just one small part for quality improvement within a port community. A more significant and complex improvement would be relationship building between different port businesses such as the shipping line, the terminal operators, freight forwarders and the final customers. Big quality improvements are still necessary in this industry and field.

9. Training

Even though creating a collaborative environment within a port is the main focus, companies need to pay attention to one of their most important resources – human capital. Good relationships are not just helpful between companies but as well between the company and its employees. Besides all the other topics addressed during the literature review, training provides a source for competitive advantage as well. It is an attribute hard to copy for other companies and therefore a good topic to differentiate from competitors. Two very different examples are Toyota and the Ritz Carlton Hotel Company.

As Mehri (2006) describes in one of his parts of the article “The Darker Side of Lean” the Toyota Production System does not perceive training as the most important to them. Production workers usually have quite a narrow field of activity and the training consists more or less of showing the worker how to do it before he has to do it himself. People barely help each other and are just focused on their own very narrow task (Mehri, 2006). This caused many unhappy worker and in return often effects the quality of the outcome.

A contrary example is the Ritz Carlton Hotel Company which emphasises training very much. This company has recognised the need for and benefits of training. According to Sucher et al. (2005) the company takes its time to recruit the right

people and provides extensive formal and informal training to assure high quality. Employees are not just tought the basic skills they need to fulfil the job but also what the culture and philosophy of the company is to make sure the workforce knows what the goal is and why they are doing things the way they are doing it. Furthermore, the company builds relationships with schools relevant for their business and use the chance to recruit the right and well educated people they need and provides the company with the newest of information in their industry. All this has helped Ritz Carlton to provide outstanding service to its customers and set them ahead of its competitors (Sucher et al., 2005).

In the article “Diversity and Competitive Advantage at Merck”, Gilmartin (1999) talks about the benefits of diversity. He claims that especially cultural diversity allows companies to understand the variety not only of customers but also of global markets and therefore represents an advantage towards those companies with a rather homogenous workforce. A company also benefits in the way that it can chose from a wider pool of potential employees in order to fulfil the goal of having talented and committed people within the company. For Merck this approach has been very successful in the past and provided them with multiple points of views (Gilmartin, 1999).

However, training does not just contain the training during or right after the hiring process but as well continuous or lifelong learning and training. Research has shown that as the workforce ages the interest in further training decreases. Therefore, companies need to find ways to motivate their employees to secure continuous training and as a result high quality. Especially in a fast paced environment nowadays faced by every company regardless of the industry continuous learning is a key to sustainable success. Fast emerging technology and the speed of information distribution make it necessary to improve training and increase the number of trainings within a work life.

In order to secure a source for latest developments in the industry, whether it is ports or any other industry, relationships to educational institutions are very important. Not just the port benefits but the educational institution as the practical component from the port brings high value for rather theoretical institutions. One example is the Valencia port that maintains a strong relationship to the Fundación de Valencia. It provides the port with a broad pool of potential employees and updates the port

community with the latest in research and development regarding the maritime industry. Many other ports have partnerships with universities or other institutions. However, again the key factors are relationship and collaboration between ports and educational institutions in order to benefit in the long term.

10. Corporate Social Responsibility

Today companies do not just provide a good or service to its customers but its field of action and influence is far more complex. As the market shifts from being supply to demand driven, there is a growing interdependence between a company and its targeted group. Big corporations have much power on their environment and influence people, the economy and society around it. This is also true for ports. It has been widely acknowledged that ports have an especially big influence on economic activity and development in the direct port environment. Therefore, companies and especially ports carry a big amount of (social) responsibility not just internally but also externally.

The term **Corporate Social Responsibility (CSR)** has a long history and evolved over a long period of time. As a result, many different interpretations and definitions exist as reviewed by Carroll (1999) and Moir (2001). One of the first widely acknowledged definitions of "Social Responsibility" from a business stand point was provided by Bowen (1953) who describes the term as "the obligations of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society" (Bowen, 1953). Already back then companies were perceived as influential institutions that are supposed to behave in favour and considered of society. Until now, the term has evolved to "Corporate Social Responsibility" clearly stating that it emphasizes social responsibility by companies. Also during this time the term has been enriched by alternative definitions over attempts to measure CSR and finally to business ethics theory, stakeholder theory and corporate social performance as stated in Carroll's (1999) review. A more concrete definition is provided by the World Business Council for Sustainable Development which defines CSR as "the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large" (WBCSD, 2011).

Moir (2001) points out many different opinions on what social responsibilities are that a company has to be focused on. Two major perspectives are taken in his article. While many authors see corporate social responsibility from a moral or ethical point of view as an obligation to use their power and influence for non-economic activities to meet social expectations, others see CSR from a neo-classical view as solely maximizing shareholder value and that it is pure self-interest that makes companies involve in CSR. The motivation for CSR by companies cannot be completely clarified in the article as non-economic activities in a moral or ethical way lead to greater customer and employee loyalty, possible new markets and improved reputation. Knowing this, a company may do it as well just for an increased shareholder value (Moir, 2001). But no matter what motivates a company to become socially involved, there are clear stated benefits for it as an increased loyalty, the possibility to identify new markets and products as well as an improved reputation and (brand) image. As the environmental and social awareness among many people increases this may be a big advantage for companies.

An increasing number of multinational companies promote CSR on their company website to inform customers about their non-economic involvement. Unilever for example has contributed a whole section on sustainability informing consumers about their involvement in local communities they operate in and the attempt to lower their environmental impact. Other companies as for example Airbus promote their alignment in the field of human rights, labour, environment and anti-corruption. Therefore, addressing interests of all stakeholders of a company. In this sense and defined by O'Higgins (2001) stakeholders refer to "any groups or individuals who can affect or are affected by the achievement of the organization's objectives" (Freeman, 1984). This is also reflected in the stakeholder theory as reviewed by Moir (2001) and described as the connection or relationship of a company to those stakeholders to whom a company should be responsible. Therefore, a classification of stakeholders has been made into primary (Shareholders, investors, employees, customers, suppliers, public stakeholder group such as governments and communities and secondary stakeholders. Primary stakeholders are those without whose participation a company would not survive and secondary stakeholders are those that are affected or affect the company without being involved in direct transaction (Moir, 2001). O'Higgins (2001) also provides an appraisal of stakeholders according to their power,

legitimacy and urgency. Accordingly, a manager should never underestimate the power and influence of any of their stakeholders. Since this may result in big problems for the company itself, whether it is an environmental or an employee issue. Legitimacy refers to stakeholders willingly or unwillingly affected by the company. That as well may be employees that are bound by contract and may by harmed by poisoned gases or a neighbour challenged by the companies water or air pollution. Urgency refers to time-sensitive claims of stakeholders that helps a company to set priorities (O'Higgins, 2001).

The literature reviews demonstrate how complex and interrelated the issues most important, not just to any company in any industry but in this case especially to ports, are. What can be seen is that there is a definite trend from working very silo based and each company seeing itself as the centre of the world to a more collaborate working style based on relationships. All the literature reviews demonstrated that the most important trend is interaction with other stakeholders, often the own employees but also other companies and the environment. To improve one issue, for example safety and security, collaboration and relationship is needed. Otherwise there will be no improvement. As the literature review states how management communicates with its employees has a large impact on how they will behave and how much effort they will put into their work. The same is true for every other mentioned topic. Good relationships build the future for all ports in order to achieve a more cluster oriented business model and is the only way to improve their overall performance.

2.3 Potential Solutions

As can be seen and concluded from the literature review combined with the findings from the Institute's four year long research, there is a need for ports to change. Ports cannot keep working like this without losing customers to the few ports that do recognise the need for change. However, as for every individual changing a ports culture and behaviour is very hard. It is not just the culture and behaviour of one company but of several companies that need to participate and change in order to improve a so highly interrelated system as a port. The port performance is just as good as the weakest link within it and therefore, cannot improve if the weakest link refuses to change and improve its operations, culture and behaviour.

Being aware of the natural resistance towards change, the first step to take is to become educated in the field and to collect information and knowledge on what is possible and what can be achieved by collaboration, information sharing, proper communication and relationship in general. This has the power to motivate ports as many visits to different ports by GIL has proven. There is a huge request for CTQI for example and many ports want to know, how to do and implement it. Using this as a proof that ports can be motivated by best in class examples, it has to be recognized by ports that it is not the individual performance that makes the difference but the collaboration between all port related businesses. From this finding the KAI theory was developed meaning **Knowledge** (K), **Authority** (A) and **Investment** (I). The theory of KAI states that to create unity amongst a group of service provider of unequal authority and financial power, knowledge is the tool first deployed.

However, in order to change, authority is needed that coordinates in an unbiased manner. According to GIL research that is the port authority as it is already the case within the best practice example. Authority assures that no company is tempted to use its superior power over other participants and thereby hindering the relationship building and avoiding the establishing of trust.

The last tool needed is Investment. To transform a port **investment** is most of the time necessary. Old traditions have to be thrown overboard and new ideas have to be implemented. Investment therefore does not necessarily represent an investment in machinery or buildings or IT systems, but will definitely be required for the training of employees which is extensive in the case of a cultural change.

The KAI theory helps to motivate a port which is necessary as stated above for the reason that ports will most likely not change if there is no incentive to do so. Further, as soon as management is motivated it is about motivating the rest of the port which includes especially other port related companies and employees. **Motivation** will be supported mainly by the tool ‘knowledge’. Not just by looking at the best practice but by being aware of what is happening in world trade and evolutions in the port industry are taking place. Afterwards ports need to **mobilize**. This includes actively looking for information with the goal in mind to change. For this stage knowledge and authority are very important. It will provide the port with necessary information about what is possible. Are companies within the port interested in changing current operations and are they willing to go through the long and hard process of evolving to more collaborate culture. At the end **adaptation** or implementation is the key factor. Ports need to actually, physically change. At this stage it is not as passive anymore and ports need to actually start implementing gained knowledge and ideas.

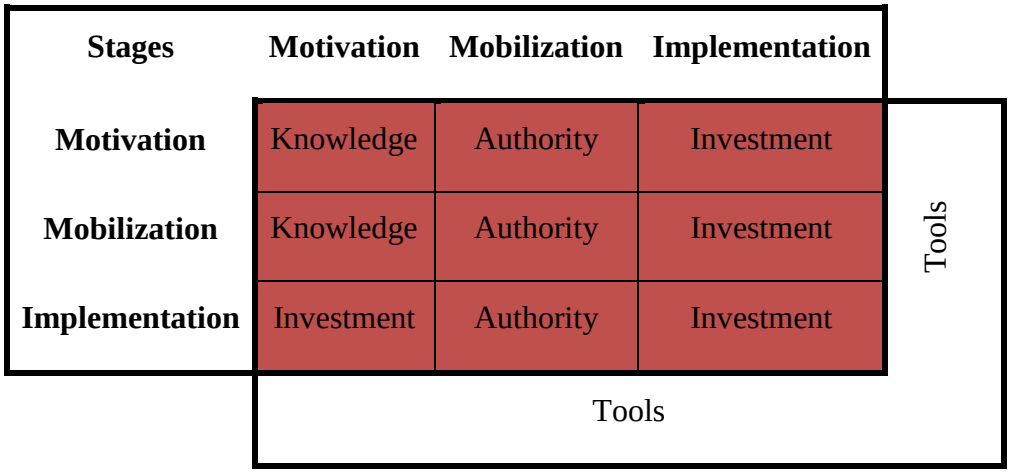
Those proposed steps, surely do sound easier than they are, but they will have to be a part of a port that wants to improve its logistics in order to increase customer satisfaction and the general economic performance.

RECOMMENDATIONS

To cope with the current trends specific for the ports industry but also the market trends impacting on trade in general a big change is needed. As the literature review emphasises and suggests one of the most important requirements is an increased collaboration between different players within a port. To achieve a higher visibility and transparency for the end customer in order to eliminate or at least decrease the black hole companies in a port need to work together and put a much stronger effort into sharing information. This can lead to more efficient operations on land as well as a higher customer satisfaction. Overall, since the port contributes significantly to the wellbeing of the community or city surrounding the port the results with collaboration and clustering would be much better as well.

One big challenge, however, is to convince all players within the port to collaborate and share information or even cluster with the players. The port includes many different companies of different financial power and authority leading to the few but often powerful companies primarily controlling and impacting the port operations leading to silo based operations. From the practical information gained by GIL and the literature review conducted using information from academics and other industries a framework for **change** is recommended as in the figure below.

Figure 5: Recommended Steps for Change



Own demonstration.

The most important component a port needs is **knowledge**. Knowledge is a motivator since it includes examples from best in class and gives an example of what can be achieved, as the Valencia case study demonstrates. In the Valencia case study the

combined effort of all port related businesses resulted in an improved overall result especially in terms of operational efficiency resulting in financial sustainability which is usually the most effective incentive. This leads to the next use of knowledge within the changing process.

Knowledge is a very important and fundamental tool to convince other port members and players. Therefore, it is useful in the mobilization process signalling that by working together and changing the attitude from keeping all information to themselves and working as silos to sharing information and working as a cluster. However, during the Mobilization stage the most important tool is **authority**. One member in the port environment has to take over the coordinating and therefore authority role. As suggested by the Institute that would best be suitable for the port authority since it plays a central role but provides no direct value added operations. Therefore, the port authority has no interest in maximizing its own profit and can concentrate in aligning all the interest of the businesses in the port by bundling them and making decisions based on end customer's needs.

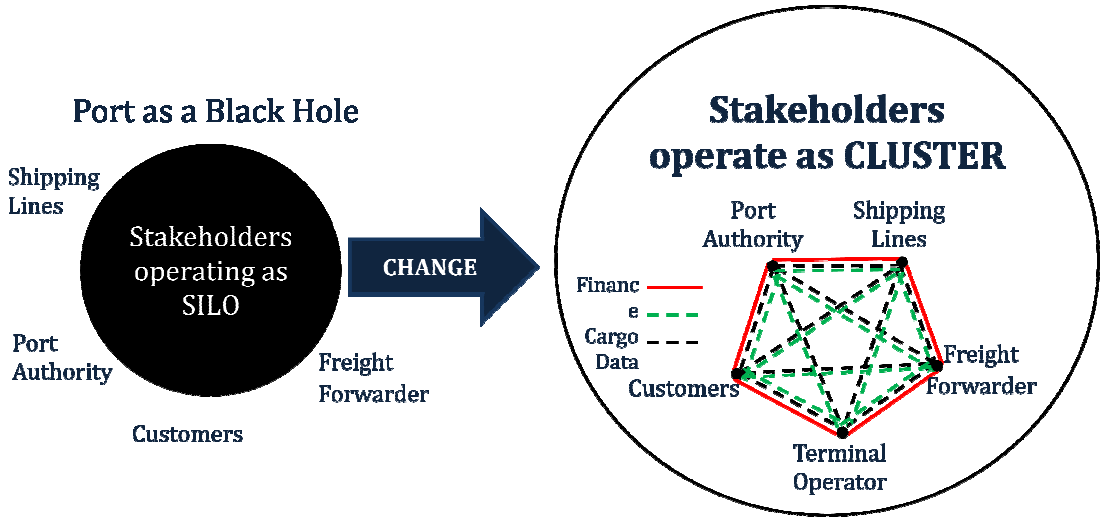
The last stage would be the actual implementation of knowledge and physically changing structures and traditional operations. This also includes the implementation of standards developed by the Institute as for example the Container Terminal Quality Indicator (CTQI). Usually **investments** are required during this stage. This may include changing the IT system in order to provide better information sharing or the implementation of environmental sustainable procedures.

The proposed framework may not be exclusive but required for changes as this process is very difficult to go through as it is natural for people and as a result also by companies to undergo changes. Knowledge, Authority and Investment is elementary to create unity amongst a group of service provider of unequal authority and financial power, where knowledge is the tool first deployed. Therefore, a structure is needed and this necessity needs to be recognised by ports and all related businesses.

CONCLUSIONS

Ports have always played an important role in maritime transportation/sea transportation. However, the evolution of ports by chance with all the stakeholder never questioning the operations but just excepting it the way it was, had prevented the port development to meet the ever changing global market environment. Ports, that have quite a long history of maritime transportation have been built by people of vision in the light foam. People at the Global Institute of Logistics believe it is time for ports to open up their mind and it is time for them to take action and making changes for the better. During the four years period, the Institute has gathered a huge amount of the information of ports and information related to port development, this includes thousands of hours of meetings and hundreds of presentation and conversations. Having analysed all the information from the perspective of supply chain and logistics management the conclusion is that ports need to evolve from working as silos to becoming an industrial cluster with relationships between all port members as shown in the figure below.

Figure 6: Ports evovling from Silos to Cluster



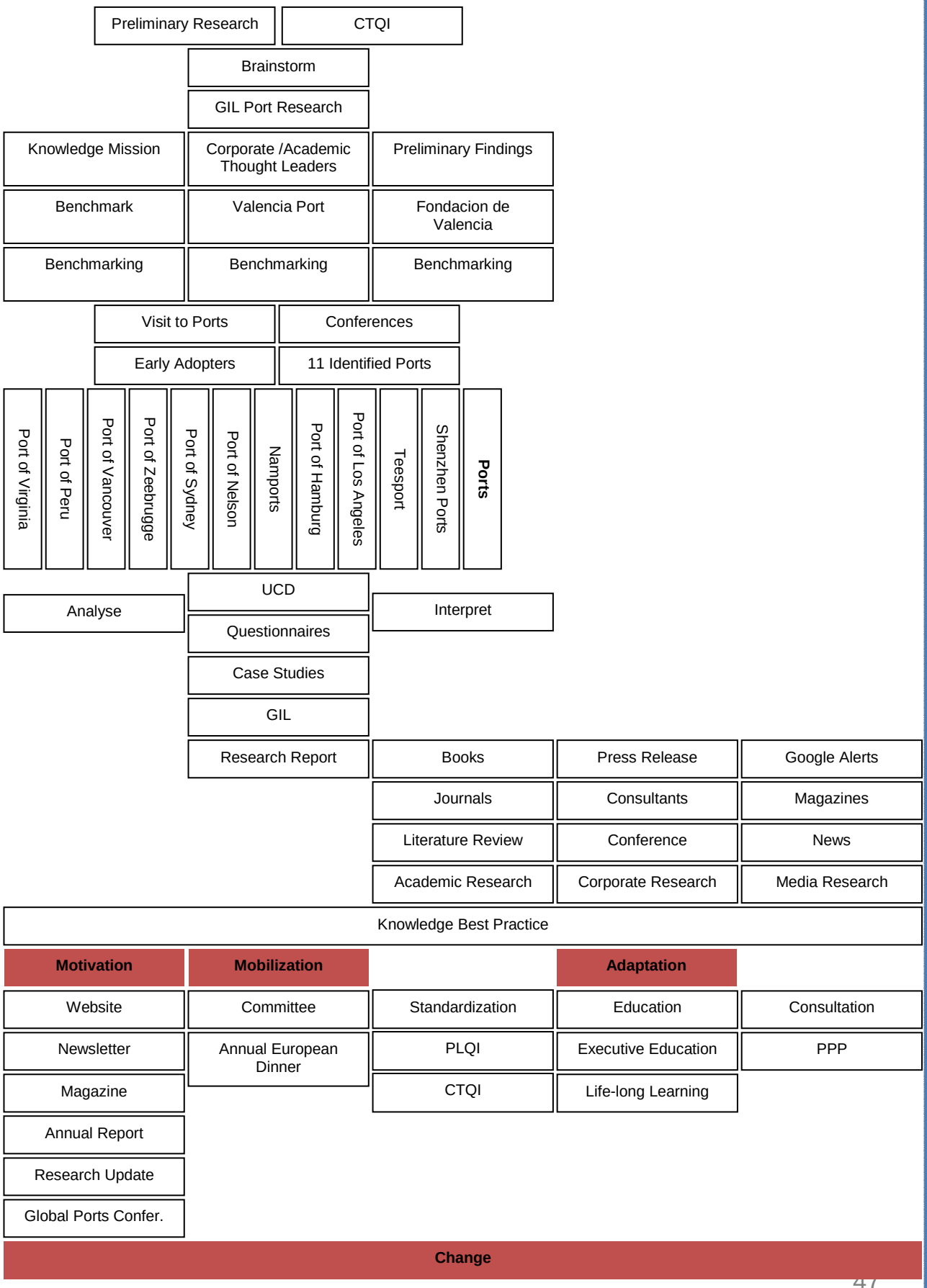
Own demonstration.

The analysis results show that there is a black hole in port management and port development cannot move forward without the elimination or at least reduction of those holes. The literature review provides academic evidence to the port world that change is necessary and a requirement in order to cope with current and future market trends. The three steps for change: motivation, mobilisation and implementation, will

help the port to design their strategy for change. Knowledge, Authority and Investment (KAI) is a useful and necessary tool to use in order to go through those processes. The uniqueness about KAI is they are not only just useful for ports to use them make change of their management but also once they are operate in the cluster they can also use KAI as their core business strategy where they can use it to sustain their strength and for further development.

APPENDICES

Appendix 1



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